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ABSTRACT

Correlates of employer-provided training while in the most recent full-time job held were explored. Respondents were nearly 10,000 members of the 1980 high school seniors cohort of the High School and Beyond survey data set. Two types of forces expected to influence participation in employer-provided training were distinguished: incentive and opportunity. Five types of factors were components of these incentive and opportunity sets: education and work experience, personal and household characteristics, personal attitudes, location, and industry/occupational affiliation. Findings indicated 40 percent of the respondents had participated in some type of employer-provided training. No important difference in the overall participation patterns in training appeared between females and males. Females spent 52 percent as many hours and 68 percent as many weeks in training compared to males. Conclusions were that different factors affect the incentives and opportunities upon which females and males acted, education and work experience appear to be more consistent correlates of female participation in training, the industry and occupational affiliation factors appear to dominate as correlates of participation in training, and employers offer training support as a substitute for alternative external sources of work skills enhancement. (YLB)

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EMPLOYER PROVIDED WORK SKILLS ENHANCEMENT IN MOST RECENT FULL-TIME JOB HELD
(Evidence from the 1984 Second Follow-up of the 1980 Senior Cohort of the High School and Beyond Survey Data Set)

by

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FOREWORD

This paper is a product of the nonresident scholar program conducted by the Research Division of the National Center for Research in Vocational Education. This program is designed to draw on scholars from outside the National Center in order to assure a broad coverage of research topics and spark a lively exchange of ideas among top scholars in the country.

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EXECUTIVE SUMMARY

This paper explores employer provided training during the most recent full-time job held reported by nearly 10,000 members of the 1980 high school seniors cohort of the High School and Beyond survey data set. The analysis reported here is based on a time period ending in February 1984.

The approach adopted in this paper is to distinguish two types of forces that are expected to influence participation in employer provided training. On the one hand, there must be an incentive to participate; and, on the other hand, there must be an opportunity to participate. Either, without the other, is meaningless.

Five types of factors are introduced as components of these incentive and opportunity sets: (1) education and work experience; (2) personal and household characteristics; (3) personal attitudes; (4) location; and (5) industry/occupational affiliation.

Among the most important descriptive information that is presented in the paper are the following:

- Forty percent of the nearly 10,000 respondents do report having participated in some type of employer provided training during the most recent full-time job held.
- Reports of formal and informal on-site training appear in an "either-or" pattern.
- No important difference in the overall participation patterns in training appear between the female and male respondents.
- The female respondents report having spent only 52 percent as many hours in employer provided training in the most recent full-time job held as is reported by their male peers (a mean total of 70 hours and 134 hours, respectively.)
- The female respondents report having spent a mean total of 3.2 weeks in employer provided training, which is 68 percent of the males reported mean total of 4.7 weeks.
- No important difference is found in the average length of time the female and male respondents report having been in their most recent full-time job (through February 1984). The respective mean durations of stay are 14 and 15 months. (This is a truncated figure for those who were still in this job at the end of February 1984.)
- One-half of the female respondents report having their most recent full-time job in the professional services (38 percent) or finance/insurance/real estate (14 percent) industries. The males are more evenly distributed, with professional services (17 percent), durable goods manufacturing (12 percent), nondurable goods manufacturing (11 percent), and construction (11 percent) comprising one-half the total.

- One-half of the female respondents report having a most recent full-time job in a clerical/unskilled occupation; this compares with a more even distribution for the males among services (18 percent), laborers (16 percent), crafts (16 percent), and operatives (16 percent).

Based on linear probability estimates of participation in employer provided training while in the most recent full-time job held, we conclude that:

- Different factors affect the incentives and opportunities upon which the female and male members of the 1980 high school seniors cohort have acted.
- Education and work experience factors appear to be more consistent correlates of female participation in employer provided training than is revealed for their male counterparts.
- The industry and occupational affiliation factors (i.e., opportunity forces) appear to dominate all other considerations examined, as correlates of the reported participation in employer provided training.
- The evidence explored is consistent with a view that employers offer training support as a substitute for alternative external sources of work skills enhancement. Only employer support for off-site work skills development after working hours appears to be associated in a complementary manner with external education and work experience factors.

The most important contributions of this paper are considered to be:

(1) The demonstration that different forces continue to influence female and male incentives and opportunities for the 1980 high school seniors cohort; and,

(2) the evidence that employers participate in the training arena when they are required to do so because of an absence of external performance.

No conclusions are reached about where training ought to be provided, or about who should pay for such work skills development. The scope of the paper's inquiry has been narrow, and the stated conclusions should be kept within this context.

SECTION I

INTRODUCTION

Select a group of high school seniors. Record information about their educational accomplishments, home environment and personal attitudes and aspirations. Two and four years later, update this record with information about post-high school education, military service and civilian employment. Now, using these data, how accurately would you expect to be able to predict which of these individuals have participated in specified types of post-high school education/training? This is the question that is addressed in the following pages.

A voluminous literature explores the general topic of work skill development (Carnevale, 1983; Carnevale and Goldstein, 1983; and, Willke and Hollenbeck, 1985 provide recent analyses and references to earlier contributions.) Here we are interested only in the establishment of entry-level work skills competency and the initial stages of work skills upgrading for a single cohort of 1980 high school graduates.

The next section offers a brief statement about the factors that might be expected to be useful in predicting post-high school participation in work skills development. This is followed by a description of the data set that has been used to explore these relationships, focusing on limitations that must be kept in mind as the statistical estimates are examined. A third section reports the results of regression analyses that have been conducted. The final section offers our conclusions based on the statistical analysis.

SECTION II

CONCEPTS FOR EXAMINING POST-HIGH SCHOOL WORK SKILLS DEVELOPMENT

A high school graduate's probability of subsequent participation in work skills enhancement can be characterized by two types of forces. On the one hand, it is practical to list factors that affect an individual's incentive to engage in this type of skills development. And, on the other hand, a complementary list of opportunity factors can be compiled. The presence of either incentive or opportunity, without the complement, is not expected to increase the probability of participation; both must clearly be present.

The challenge confronting the analyst is how to record accurate measures of these incentive and opportunity factors. It is apparent at the outset, for example, that neither vector of factors is invariant through time.

The approach that has been adopted here is to group the incentive and opportunity forces into four categories:

- previous education and work experience, upon which work skills development can build;
- personal and household characteristics;
- personal attitudes; and,
- location.

It is often difficult to separate the incentive and opportunity forces represented by a single measure. For example, a graduate's high school location (urban, suburban or rural) will represent, with substantial imprecision, both peer group effects on individual aspirations and employers' assessment of the quality of educational preparation.

Previous Education and Work Experience

This vector of variables can be further split into four categories:

- o educational credentials (including military service);
- o test scores, grades and specific courses completed;
- o work experience during high school years; and,
- o work experience since graduation.

The reason for identifying these four categories is that substantial disagreement persists about the relative importance of each. If a credential, such as a high school diploma, is thought to be a reliable "signal" of uniform educational accomplishment, insofar as a prospective employer cares about such an achievement, then test scores, grades and specific course completion shouldn't matter in that particular decision context. However, if the credential is thought to be a poor "signal" of the individual's candidacy, then the more precise measures will be important.

Similar ambiguity is associated with each of the other two categories. Work experience during the high school years is viewed by some as a detraction from educational commitment, which might lead one to expect a negative influence on subsequent opportunities to further enhance work skills. (The qualifier "might" is used here because, even if work and educational commitments are substitutes during high school, previous work experience might be a more important determinant than high school achievements of subsequent opportunities to further develop work skills.) Others view work experience during the high school years as an

important complement to the educational experience; one that gives the student a better understanding of the importance of classroom learning for subsequent employment and earning opportunity.

Similarly, post-high school work experience as a determinant of current opportunities generates substantial disagreement among analysts. Some argue that the enterprise-specific nature of many work skills is such that previous external accomplishments are of little importance. Others counter that commonalities among the work task requirements of different enterprises are sufficiently pervasive to make prior work experience an important determinant of current opportunities.

Unfortunately, data set limitations, which are described in Section III, bar a frontal attack on these disagreements in this paper. However, the previous education and work experience forces are well represented in the data set, so useful analyses can be conducted.

Personal and Household Characteristics

The "standard" demographic characteristics that one would include in a specification of the determinants of post-high school work skills enhancement include:

- o sex;
- o race;
- o parents education;
- o parents income;
- o own physical or mental handicap; and,
- o commitment to community values.

A reader might disagree about the authors' decision to place some of the individual variables in one category, rather than in another grouping. For example, we have chosen to include an individual's church attendance and high school participation in extra-curricular activities in this "personal and household characteristics" grouping, as indices of community values commitment. A different analyst might have chosen to include these in the "personal attitudes" category. Obviously, this decision will not affect the statistical estimates that are reported in Section IV.

Personal Attitudes

This vector of variables is intended to capture the student's mindset during their senior year in high school. The following composite scores were derived from information collected at that time:

- o self concept;
- o locus of control;
- o work orientation;
- o family orientation; and,
- o community orientation.

In addition, measures of reading habits, involvement in disciplinary actions while in high school, and enjoyment of working hard in school and for pay were recorded at that time.

Again, the reader is cautioned that incentive and opportunity forces should be expected to change through time. Attitudinal composite scores and reported behavior during the high school years may bear little relationship to subsequent measures of the same variables.

Location

It was noted earlier that location measures often confound both incentive and opportunity forces because there is insufficient information available to identify each alone. As an influence on the probability of post-high school work skills enhancement, two different geographic location considerations are pertinent:

- o high school location; and,
- o the individual's subsequent location(s).

Clearly, the individual has more control over geographic location after high school graduation than they did over their residence during the high school years.

A different type of "location" consideration that is of presumed importance here is industry/occupational affiliation. Each of these measures identifies a more accurate context for investigating work skill enhancement opportunities and incentives than would be available otherwise.

Summary of Model Specification

The probability of participation in post-high school work skills enhancement has been stated as a function of four vectors of variables: (1) previous education and work experience (including military service); (2) personal and household characteristics; (3) personal attitudes; and (4) location.

The reader should wonder, at this point, what "participation in post-high school work skills enhancement" means. It is well known that both formal and informal sources of skill development exist. It is also well known that the boundary between "academic" and "vocational" education is difficult to define. This issue is elaborated upon in Section III, which follows.

SECTION III

THE 1980 SENIOR COHORT OF THE HIGH SCHOOL AND BEYOND SURVEY DATA SET

The National Center for Education Statistics entered into a contract with The National Opinion Research Center to collect longitudinal data from a national sample of 1980 high school seniors. To date, three waves of data have been collected:

- o during the winter semester of the students' senior year in high school (1980);
- o two years later, during the spring of 1982; and,
- o another two years later, during the spring of 1984.

The statistical estimates that are reported in Section IV are based on data items selected from each of these three waves of data collection. All information about high school courses taken, test scores, grades, extra-curricular activities, home environment, attitudes and work experience up to that time, were collected during the first wave of data collection during the winter of 1980. Information about post-high school military service, education, work skills enhancement and work experience were collected in both the second and third wave interviews.

The estimates that are reported in Section IV are subject to standard cautions about nonresponse biases, self-reporting errors and omitted variable problems. Each of these concerns is explored below.

The nonresponse problem arises in two ways. First, the absence of second- and third-wave interview information would be expected to occur more frequently among highly mobile individuals, among those who exhibit less conformity with social norms, and

among those who have been less successful since graduation from high school. And second, an individual's failure to respond to a specific item on the questionnaire (in a personal interview setting) would not be expected to be randomly distributed among the respondents.

The self-reporting source of error arises both from an unavoidable imprecision in the definition of terms used in the questionnaires and from a lack of awareness by some respondents about the provision of some types of work skill augmentation. Again, the distribution of these sources of error would not be expected to be random across the respondents.

And finally, the omitted variables problem occurs because the analyst is unable to identify an appropriate measure for each of the forces that has been specified in the model of work skill enhancement set forth in Section III above. The most serious of these omitted variables is an accurate measure of work skill enhancement that occurred between high school graduation and entry into the current, or most recent, job. The information that is used to identify participation in work skills development in Section IV refers only to "the most recent full-time job you have held". Two other omitted variables are thought to be of particular importance: union membership status and the presence of another earner in one's household. Union membership would be expected to have an important effect on the opportunity to participate in work skill enhancement. This status would also be expected to affect an individual's likelihood of being aware of training received. The presence of another earner in the household would affect both opportunity and incentive factors.

Respondents to the Second Followup Questionnaire, administered during the spring of 1984, were asked the following question (if they had held any full-time job between leaving high school and the end of February 1984): "Considering the most recent full-time job you have held, which type(s) of employer-provided training benefit(s) or training program(s) did you receive or participate in?" The following response categories were provided:

- "Employer-provided job training during working hours on employer premises"
- "Informal on-the-job training (e.g., assigned to work with someone for instruction or guidance, etc.)"
- "Employer-provided education or training provided during working hours away from employer premises"
- "Tuition aid and/or financial assistance for attending educational institutions after working hours"
- "Other (SPECIFY)"
- "NONE OF THE ABOVE"

For each response category to which an affirmative response was given, both "number of hours per week" and "total number of weeks" of such training were also sought.

The reader is again cautioned that the wording of this question refers to "employer-provided training benefit(s) or training program(s)..." for the most recent full-time job held. Respondents who were on military active duty at the time of the interview, and those who previously had served on military active duty without a subsequent full-time job, were deleted from the sample population for our analytical purposes.

Look again at the wording of the response categories above. The distinction between "formal" and "informal" on-site training is left up to the individual respondent. We conclude that

the distinction between the two types of training is likely to result in respondents choosing the "informal" response when in doubt. "Formal" training is likely to be associated with a total separation of learning from production, although no such definition was offered to the respondents.

The regression estimates that are reported in Section IV offer linear probability estimates of participation in each of the five affirmative response categories, linear estimates of the total number of hours (number of hours per week x total number of weeks) spent in each type of training, and estimates of both participation probability and total hours for all of the individual categories combined.

The following data set "cleaning" operations were performed prior to submitting the regression runs:

- Hours of work per week were capped at 70 to take account of outlier values associated with such occupations as firefighter and law enforcement officer;
- hours of training per week were not permitted to exceed hours of work per week; and,
- weeks of training were not permitted to exceed weeks of employment in the most recent full-time job held.

Table 1 displays descriptive information about the 1980 high school senior cohort's employment and work skills enhancement experiences, which provide the basis for the regression analyses that are introduced in Section IV. The 9,602 observations include 5,320 (55 percent) females and 4,282 (45 percent) males.

TABLE 1

SELECTED WORK SKILLS ENHANCEMENT DESCRIPTORS

	Females (N=5,320)	Males (N=4,282)
Participated In:		
o Formal on-site training	26 percent	22 percent
o Informal on-site training	27	25
o Formal off-site during work hours	5	5
o Tuition aid after work hours	2	2
o Other employer provided training	2	2
o Any one or more of the above	41	39
Have Enrolled In/Attended Post-High School Education:	(N=5,320)	(N=4,282)
	70 percent	66 percent
Total Hours Participated In Above Training:	(Mean)	
	(N=4,364)	(N=3,525)
o Formal on-site training	36 hours	62 hours
o Informal on-site training	32	71
o Formal off-site during work hours	4	7
o Tuition aid after work hours	4	5
o Other employer provided training	4	6
o All of the above combined	70	134
Total Weeks of Employer-Provided Training:	(Mean)	
	(N=5,320)	(N=4,282)
	3.2 weeks	4.7 weeks
Total Months Worked In Most Recent Full-Time Job:	(Mean)	
	(N=5,320)	(N=4,282)
	14 months	15 months
Industry Affiliation Of Most Recent Full-Time Job:	(N=2,982)	(N=2,589)
o Agriculture, Forestry, Fisheries	1 percent	5 percent
o Mining	-	1
o Construction	2	11
o Durable Goods Manufacturing	6	12
o Nondurable Goods Manufacturing	10	11
o Transportation, Communications, Utilities	4	8
o Wholesale Trade	3	4
o Finance, Insurance, Real Estate	14	5
o Business Services	5	10
o Personal Services	8	3
o Entertainment, Recreation	3	5
o Professional Services	38	17
o Public Administration	6	8
TOTAL	100 percent	100 percent

Occupational Affiliation of Most Recent Full-Time Job:	Females (N=4,048)	Males (N=3,339)
o Professional and Technical	10 percent	12 percent
o Managers and Administration	4	6
o High Level Sales Personnel	-	1
o Clerical and Unskilled	49	13
o Craftsperson	2	16
o Operatives	7	16
o Laborers, Except Farm	2	16
o Farmers and Farm Managers	-	-
o Farm Laborers and Foremen	-	2
o Service, Including Household	26	18
TOTAL	100 percent	100 percent

Four out of every ten of these 1980 high school graduates reported having held a full-time job and participated in some type of "employer provided training benefit(s) or training program(s)..." between then and the end of February 1984. (Again, this does not include those who were on military active duty at the time of the second followup interview, or those who had been on military active duty and had not held a full-time job since leaving military service.)

The composition of the reported employer provided training in the most recent full-time job held is heavily concentrated in the formal- and informal-on site categories. This should come as no surprise, since fewer than four years of post-high school job tenure could have been compiled with any single employer. In addition, those 1980 high school graduates who had pursued full-time post-high school education are omitted from our sample. It is interesting to note that relatively few respondents reported both formal- and informal-on site training offered in the most recently held full-time job; more female than male respondents report a combination of the two.

The reader is cautioned against misinterpreting the forty percent participation rate. Since only the most recent full-time job is in question, it is possible that some respondents had participated in employer-provided training in previously held post-high school jobs, which would not have been recorded in the followup survey. Therefore, we cannot conclude that sixty percent of the respondents had never participated in employer provided training. No important difference between female and male participation rates is observed in Table 1.

Substantial differences are revealed in Table 1 between male and female reports of the number of hours they had spent in employer provided training on the most recent full-time job held. The female respondents report having spent only 58 percent as much time as their male counterparts in formal on-site training, and only 45 percent of the mean number of hours male respondents report having spent in informal on-site training. Again, red flags must be waved here. Since only the most recent full-time job is pertinent, we are unable to distinguish between an explanation based on occupational segmentation at the entry point and an alternative explanation based on differential promotion opportunities. Indeed, there might even be sex-based differences in self-reporting errors; if, for example, males have been conditioned to be more aware of promotional opportunities.

When the total number of hours of employer provided training in the most recent full-time job held is examined it is seen that females reported fifty-two percent of the male respondents total; the equivalent of one and three-fourths full-time weeks for females and three and one-third full-time equivalent weeks for males. These figures represent the combined totals of all forms of reported employer-provided training, with simultaneous learning and production being reflected in an unknown portion of this total.

The fact that the female respondents report having spent two-thirds as many weeks in employer provided training as did male respondents (3.2 weeks and 4.7 weeks respectively) indicates that the females spent fewer hours per week in training, on the average, than the males did.

and male respondents had spent in the current or most recent full-time job through the end of February 1984.

Still referring to Table 1, substantial differences are seen in the female and male industry and occupational affiliations in the most recent full-time job held. Some caution should be exercised here, because the missing data problem is particularly acute: only 56 percent of the females and 60 percent of the males who reported having participated in employer provided work skills enhancement have valid industry affiliation codes. (The corresponding occupational affiliation valid code figures are 76 and 78 percent respectively.)

As one would expect, the male respondents are more heavily concentrated in the construction, durable goods manufacturing, transportation/communications/utilities, and business services industries; while more than half of the female respondents are clustered in the finance/insurance/real estate, and professional services industries.

Occupationally, three out of every four female respondents are found in the clerical/unskilled, or service (including household), categories. Nearly half of the male respondents are equally distributed among three catagories--craftsperson, operatives, and laborers (except farm).

These industry and occupational affiliation differences can be expected to explain some of the male/female differences in employer provided training that have been revealed elsewhere in Table 1.

Finally, more than two-thirds of the respondents report having participated in some type of post-high school education, with little difference appearing between females and males.

With this information serving as a limited introduction to the characteristics of the sample members, we proceed in the next section to report the results of linear regression analyses of participation rates and time spent in specific types of employer provided training associated with the most recent full-time job held.

SECTION IV

STATISTICAL ANALYSIS

The following approach is adopted in this section to minimize the reader's burden of absorbing figures that contribute little, if anything, to an overall understanding of the issue under examination. First, all results are reported separately for female and male respondents. It was anticipated, and the results have borne out, that different forces influence female and male incentives and opportunities to participate in employer provided work skills enhancement. Second, the participation results are investigated separate from the hours of training results. And third, the results are reported in this section only in terms of positive or negative, and statistically significant, association with the dependent variable in question. Comprehensive reporting of coefficient values and standard errors is deferred to the appendix.

The order of discussion is as follows: First, the dichotomous dependent variable "participated in employer provided training while in most recent full-time job held" is explored. This is followed by an examination of each of the five component types of employer provided training. Then, total hours and total weeks of employer provided training are analyzed. And finally, hours reported spent in each of the component types of training are introduced. So, in all, the results of twenty-six regressions are reported. (Again, see the appendix for full information.)

Participated in Training

The following estimates of statistically significant correlates of reported participation in employer provided work skills enhancement while in the most recent full-time job held were obtained:

	Females	Males
Education and Work Experience		
Hours worked during senior year	+ .003	+ .004
Hours worked summer of 1979	+ .002	
Trade or technical courses taken	+ .030	
Mathematics courses taken		- .030
Reading score in high school	+ .004	
Attended post-high school education	- .080	
Months worked in most recent job	+ .001	
(Months worked in most recent job)2	- .0002	
Personal and Household Characteristics		
Nonwhite	- .060	
Hispanic		+ .080
Age	- .050	
Participated in band/chorus/glee club		+ .040
Participated in student government		- .050
Personal Attitudes (While in High School)		
Interference while in school	+ .030	
Read front page of newspaper	- .020	
Community orientation composite score		+ .030

Industry/Occupational Affiliation	Females	Males
Industry		
Durable goods manufacturing		+ .13
Nondurable goods manufacturing	+ .10	+ .12
Transportation/communications/	+ .15	
Finance/insurance/real estate	+ .23	
Entertainment/recreation	- .21	- .13
Public administration	- .12	+ .13
Occupation		
Managers and administration	+ .24	
Farm laborers		- .30

Recognizing the vulnerability of the linear probability estimation procedure, the quantitative results presented in the tabulation suggest that the industry and occupational affiliation factors are substantially more important to an understanding of employer-provided training than are previous education, work experience, attitudes and personal characteristics. (Of course, this leads one to ask: What are the determinants of industry and occupational affiliation? Here, variables in the other three vectors are of obvious importance.) This result offers strong evidence about the importance of opportunity to participate in employer provided training.

We can only speculate about the reasons for the differing lists of statistically significant coefficients for female and male respondents. Taking due consideration of the frailties in the statistical estimation procedure, there appears to be a greater amount of continuity between high school experiences and employer provided training in the most recently held job for females than for males. This assertion is based on the presence of more statistically significant education and work experience variables in the female estimates than in the male regression estimates.

Formal On-Site Employer Provided Training

Adopting the same format as above to facilitate reader understanding, the female and male respondents reports of having participated in formal on-site employer provided training while in their most recent full-time job produce the following regression results:

	Females	Males
Education and Work Experience		
Reading score during senior year	+ .003	
Worked in regular school period	- .070	
Worked only in summer of 1979	- .090	
Weekly hours worked senior year	+ .003	+ .002
Enrolled in post-high school ed	- .080	
Months worked most recent job	+ .008	
(Months worked most recent job)2	- .0001	-
Mathematics courses taken		- .030
Mathematics score senior year		- .003
Was in military active duty		+ .150
Personal and Household Characteristics		
Physical/behavioral handicap	+ .33	
Participated in athletics	+ .02	
Participated band/chorus/glee cl		+ .03
Participated student government		- .05
Hispanic		+ .07
Personal Attitudes		
Community orientation comp score	+ .03	
Location		
Mountain census region	+ .13	
South Atlantic census region		- .07
West north central census region		- .09
High school located in suburb		+ .07
Industry/Occupational Affiliation		
Industry		
Agriculture, forestry, fisheries		+ .17
Durable goods manufacturing		+ .14
Finance/insurance/real estate	+ .12	
Entertainment/recreation	- .18	
Occupation		
Managers and administration	+ .18	
Craftsperson	+ .19	
Laborers, except farm		- .11
Farmers and farm managers		- .44
Farm laborers		- .41

Here we find only one factor, weekly hours worked during the senior year in high school, that is a statistically significant correlate of formal on-site employer provided training for both the female and male respondents. This finding reinforces our supposition that different forces mold the incentives and opportunities faced by female and male high school graduates when they enter the workforce.

Again, recognizing the limitations of the linear probability estimating procedure, the quantitative importance of current industrial and occupational affiliations as correlates of employer-provided on-site formal training is apparent.

All of the non-industry/occupational affiliation negative correlates of formal on-site training provided in the most recent full-time job held suggest that on-site training is offered in response to deficiencies in prior (i.e., external) work skills preparation. For example, the negative coefficients within the "education and work experience" vector of variables are:

- worked in regular school period;
- worked only in summer of 1979 (before senior year);
- enrolled in post-high school education;
- mathematics courses taken; and,
- mathematics score during senior year.

This pattern should also be read as evidence of the probable importance of work skills development that occurred after high school but before entry into the most recently held full-time job. We turn next to informal training, having concluded that self-reporting errors are likely to favor informal over formal on-site training.

Informal On-Site Employer Provided Training

Earlier we speculated that respondents would be likely to associate formal training with nonparticipation in actual production (i.e., training as the sole activity.) The boundary between formal and informal on-site training is therefore thought to be unclear. In addition, it is likely that the boundary between informal training and an absence of further work skills development is also unclear. The combined effects of overreporting at one boundary and underreporting at the other boundary are therefore unknown.

The following regression results were obtained for the dependent variable "probability of participation in informal on-site employer provided training in most recent job held":

	Females	Males
Education and Work Experience		
Participated in voc ed/work study	- .070	
Disciplinary problems in high school	- .060	
Weekly hours worked summer of 1979	+ .0002	
Reading score senior year	+ .003	
Mathematics courses taken		- .03
Enrolled in post-high school education	- .060	
Months worked in most recent job held	+ .009	
(Months worked in most recent job)2	- .0002	
Personal and Household Characteristics		
Nonwhite	- .08	
Age	- .05	
Read for pleasure	+ .02	
Read front page of newspaper		- .02
Participated in band/chorus/glee club		+ .04
Parents always knew what I was doing		- .05
Industry/Occupational Affiliation		
Industry		
Finance/insurance/real estate	+ .18	
Entertainment/recreation	- .14	- .13
Occupation		
High level sales personnel	- .29	

These estimates are consistent with the tentative conclusion stated in the previous subsection. Here again the pattern of non-industry/occupational affiliation negative coefficients suggests

that employer provided training, formal or informal, is offered as a substitute for other external sources of work skills development. The negative age coefficient for female respondents, for example, appears to reflect "late" graduation from high school, which probably indicates deficient performance at some prior time.

The industry/occupational affiliation coefficients continue to show the dominant influence reflected in the two previous subsections. (Of course, the dichotomous "training" variable is not independent of the "informal on-site training" variable.) The negative sign on the High Level Sales Personnel coefficient for female respondents is interpreted as additional evidence that the requisite work skills have already been learned in a high school, cooperative education, or previous employment setting.

Formal Off-Site Employer Provided Training

The factors associated with an employer's provision of off-site training during working hours, or tuition aid for training after working hours, are expected to be different than those associated with on-site formal and informaal employer provided training. The industry and occupational affiliations associated with the respective forms of training support would be expected to differ. The link between education and work experience and off-site training benefits is expected to emphasize complementary forces, rather than the substitution phenomenon pointed out above for both formal and informal on-site training.

Recall, too, as the regression estimates are examined on the following page, that only five percent of both the female and male respondent populations reported having participated in formal off-site training during working hours.

The regression results for which probability of having participated in "formal off-site training during working hours" is the dependent variable are as follows:

	Females	Males
Education and Work Experience		
Worked during regular school period	- .03	
Personal and Household Characteristics		
Participated in voc ed/jr achievement		+ .02
Participated in youth club/church		- .01
Father's education		- .006
Nonwhite		- .03
Personal Attitudes		
Community orientation composite score		+ .03
Work orientation composite score	+ .02	
Location		
School in suburb		+ .03
Industry/Occupational Affiliation		
Industry		
Construction		- .06
Wholesale/retail trade		- .06
Transportation/communications/ public utilities	+ .09	
Finance/insurance/real estate	+ .06	
Public administration	+ .11	
Occupation		
Managers and administration	+ .07	+ .08

The estimates reported here are consistent with the expectation that the pertinent factors would differ from those reflected in the on-site training results. The industry and occupational affiliations represented are consistent with well known differences between professional/technical/managerial roles, on the one hand, and processing/operative/subordinate roles, on the other hand. These same factors are expected to appear in the tuition aid for training after working hours results, too.

Clearly, for high school graduates who are only four years beyond that event, the three types of training examined above would be expected to encompass most employer provided training.

Tuition Aid For Training After Working Hours

Presumably, an employer's willingness to offer a tuition subsidy to an employee is a function of that employer's expectation of extended employment continuity or higher productivity during an unchanged job tenure. This selection criterion is therefore expected to appear in the correlates of reported participation in such a benefit. The regression results are presented below:

	Females	Males
Education and Work Experience		
Mathematics courses taken	+ .01	
Grades in high school	+ .002	
Months worked in most recent job	+ .002	
(Months worked in most recent job)2	- .00004	
Personal and Household Characteristics		
Religious attendence		+ .02
Family income		+ .0007
Mother's education		- .005
Nonwhite		- .02
Personal Attitudes		
Enjoy working hard in school	+ .02	
Location		
School located in rural area		- .02
West south central census region		- .03
Industry/Occupational Affiliation		
Industry		
Construction	+ .09	
Durable goods manufacturing	+ .05	+ .04
Transportation/communications/ public utilities	+ .05	
Finance/insurance/real estate	+ .10	+ .09
Public administration		+ .05

The non-industry/occupational affiliation factors that appear above are consistent with the premise that prospective job tenure and expected productivity are considerations used by employers to select candidates for tuition assistance. (This conclusion does not extend to the "nonwhite" coefficient for male respondents.)

Other Employer Provided Training

Since only two percent of both the female and male respondents report having participated in "other" employer sponsored training while in their most recent job, and because this residual category has little practical meaning, tabular results of the regression estimates are not presented here.

Only two factors of substantive importance are observed (see the appendix for regression results.) For female respondents, prior military active duty service is the single largest factor associated with the probability of having received "other" employer provided training. This finding requires no elaboration. For males, the occupational affiliation "farmers and farm managers" is the single most important factor. Again, no further elaboration is necessary.

So, as one would expect when examining a residual classification, special circumstances appear to predominate; little of generalizable value is likely to be learned.

Summary of the Component Types of Employer Provided Training

Up to this point we have explored the correlates of respondent probabilities of having participated in employer provided training of five types while employed in the most recent full-time job held.

It is clear that different forces influence the incentive and opportunity sets that mold the female and male respondents' actions. It is also clear that the industry and occupational affiliations of the respondents in their most recent full-time jobs are of substantial importance in explaining participation in employer provided training. What, then, can be said about the amount of time that is spent in these training activities? We turn to this question next.

Total Hours Spent in Employer Provided Training

This measure is the sum of "hours of training per week" multiplied by "weeks of training" for each of the five types of employer provided training offered while the respondent was in the most recent full-time job held. Obviously, reporting error is a more serious problem here than it is with respect to the participation variable alone. For example, some of the respondents have remained in the same job that they secured while in high school. In such cases, they are reporting on training received over as much as a six year time span, or longer.

Recall at the outset here that the female respondents report having spent a mean total of 70 hours in employer provided training while in the most recent full-time job held, while their male counterparts report a mean total of 134 hours in employer provided training.

The regression results for total hours of training are:

	Females	Males
Education and Work Experience		
Received mostly A's/B's in trade	+ 68 hours	
Total months worked most recent job	+ 5	+ 18 hours
(Total months worked most recent job)2		- .3
Military active duty service		+ 189
Grades in high school		+ 5
Personal and Household Characteristics		
Age	- 30	
Interference in high school		+ 31
Disciplinary problems in high school		- 61
Participated in athletics in high school		- 22
Parents always knew what I was doing		- 59
Location		
Mountain census region	+ 75	
Pacific census region	+ 56	
Industry/Occupational Affiliation		
Industry		
Transportation/communications/public utilities		+ 177
Professional services	+ 37	
Public administration		+ 206
Occupation		
Managers/administration		+ 145

A pattern similar to that reported for the dichotomous participation decision is observed here. The industrial and occupational affiliations continue to dominate in terms of quantitative importance. The military active duty service coefficient for male respondents appears to suggest a strong complementarity between prior military training and an employer's provision of a substantial number of hours of training. Also, as was noted earlier, measures of deficiency during the high school years (e.g., age for female respondents and disciplinary problems for males) exhibit a negative association with total hours of employer provided training. Overall, it is concluded that the opportunity variables are of predominant importance as correlates of hours spent in employer provided training.

Total Weeks Spent in Employer Provided Training

A specified total number of hours of employer provided training can be accumulated with substantially different combinations of hours per week and number of weeks of training. On the one hand, intensive full-time training can be offered at the outset, with no followup; or, on the other hand, part-time training can be offered over an extended period of time. (This is why concern was expressed earlier with self-reporting errors associated with the distinction between formal and informal on-site training. In the part-time training case, learning and production occur together day in and day out, while in the full-time training setting the two activities are likely to occur sequentially.)

The pertinent regression results are:

	Females	Males
Education and Work Experience		
Military active duty service	+ 8.2 weeks	+ 6.0 weeks
Total months worked most recent job	+ .3	+ .6
(Total months worked most recent job)2	- .004	- . 01
Personal and Household Characteristics		
Age	- 1.0	
Parents always knew what I was doing		- 1.5
Personal Attitudes		
Community orientation comp score		+ 1.2
Location		
Mountain census region	+ 2.5	
Pacific census region	+ 1.7	
Industry/Occupational Affiliation		
Industry		
Wholesale trade	+ 2.9	
Finance/insurance/real estate	+ 2.7	
Transportation/communications/pub util		+ 4.0
Public administration		+ 7.5
Occupation		
Laborers, except farm		- 3.4
Farm laborers		- 8.1

Once again, the "special circumstances" explanation for the statistical estimates must be introduced. It is not surprising that military active duty service, certain industries, and the agricultural occupations appear as dominant influences on the weeks of employer provided training reported by the respondents. This consideration is also relevant in the interpretation of the hours spent in individual types of training, which are examined below.

Hours of Formal On-Site Employer Provided Training

It is reasonable to expect the least amount of reporting error to occur with respect to this type of training. The regression results are:

	Females	Males
Education and Work Experience		
Received mostly A's/B's in trade	+ 55 hours	
Total months worked in most recent job	+ 2	+ 7 hours
(Total months worked most recent job)2		- .1
Military active duty service		+ 105
Participated in cooperative voc ed		+ 56
Participated in voc ed/junior achievement		- 26
Mathematics score		- 2
Personal and Household Characteristics		
Physical or behavioral handicap	+ 146	
Participated in athletics	+ 7	
Participated in cheerleading/pep club		+ 54
Family income unknown		+ 73
Personal Attitudes		
Locus of control composite score	- 14	+ 42
Location		
Mountain census region	+ 69	
Pacific census region	+ 33	
East south central census region		+ 124
Industry/Occupational Affiliation		
Industry		
Agriculture, forestry, fisheries		+ 140
Durable goods manufacturing	- 43	+ 65
Transportation/communications/pub util		+ 87
Public administration		+ 82
Occupation		
Managers/administration		+ 81
Farm laborers		- 165

There is no need to belabor the obvious: The patterns seen in previous results above are repeated here. With few exceptions, the forces that are associated with hours spent in formal on-site employer provided training as reported by female respondents are quite different from those exhibited for the male respondents.

Hours of Informal On-Site Employer Provided Training

The "informal" designation here should be read as a red flag with respect to accuracy of respondent reporting. The regression estimates are:

	Females	Males
Education and Work Experience		
English courses taken	+ 15 hours	
Participated in voc ed-work study	- 23	
Weekly hours worked summer of 1979	+ .5	
Total months worked in most recent job	+ 2	+ 8 hours
(Total months worked most recent job)2		- .1
Personal and Household Characteristics		
Age	- 17	
Participated in cheerleading/pep club	- 13	
Mother's education	- 4	
Participated in athletics		- 15
Parents always knew what I was doing		- 34
Industry/Occupational Affiliation		
Industry		
Construction		+ 81
Professional services	+ 25	
Public administration		+ 106
Occupation		
Craftsperson		+ 75
Services, including household	- 26	

No new, or contradictory, results are found here. It is interesting to note that no personal attitude or location factors are included among the statistically significant correlates of informal on-site employer provided training.

The results of the remaining three regressions, in which the dependent variables are "hours in off-site formal training during working hours", "hours in off-site training after working hours

for which the employer has paid tuition", and "hours spent in 'other' employer provided training", respectively, are not presented here. We simply have too little confidence in the accuracy of self-reported information for these types of training to press ahead. Suffice it to say that no reversal of the consistent results reported up to this point is revealed in these estimates.

SECTION V

SUMMARY AND CONCLUSIONS

The objective in this paper has been to explore the correlates of employer provided training while in the most recent full-time job held, as reported during the spring of 1984 by nearly 10,000 members of the 1980 high school seniors cohort of the High School and Beyond survey data set.

We found that 40 percent of the respondents report having participated in some type of employer provided training while they were in the most recent full-time job held. Caution has been urged in the interpretation of this figure, since we do not know the incidence of employer provided training between high school leaving and entry into the most recent full-time job held.

Approximately one-fourth of both the female and male respondents report having participated in formal and/or informal on-site training. Fewer than five percent report having participated in the off-site or "other" types of training.

Female respondents report having spent a mean total of 3.2 weeks and 70 hours in employer provided training, while their

male counterparts report mean totals of 4.7 weeks and 134 hours respectively.

More than one-half of the female respondents reported that their most recent full-time job was in the professional services or finance/insurance/real estate industries. The males reported a more even industry distribution, with professional services, durable goods manufacturing, nondurable goods manufacturing, and construction accounting for one-half of the reported affiliations.

One-half of the females reported occupations in the most recent full-time job held in the clerical/unskilled category; while males are again distributed more evenly among services, laborers, craftspersons, and operatives.

The major conclusions reached on the basis of the regression analyses reported in Section IV are:

- The correlates that are exhibited in separate female and male regression estimates are quite different for both participation and hours specifications. Different forces appear to influence the incentives and opportunities that have confronted these young female and male employees.
- Measures of prior education and work experience appear to be more consistently important as correlates of the female respondents' reported participation in employer provided training than these factors were for their male peers.

- The industry and occupational affiliation represented by the most recent full-time job are of dominant importance for both female and male respondents as correlates of both participation in employer provided training and the amount of time spent in that activity.
- The statistical evidence reported in this paper is consistent with the view that employers provide training as a substitute for alternative external sources of work skills development. A complementarity appears when employer support for off-site training after working hours is examined.

The two major contributions that this paper makes are:

(1) the documentation that different forces continue to mold the incentives and opportunities faced by young female and male labor force participants who left high school in 1980; and,

(2) the presentation of evidence that employers provide training opportunities when they are forced to, but they accept external sources of work skill enhancement as an alternative to their own investment.

These conclusions are stated on the basis of our analysis of an imperfect data set for exploring the questions that have been addressed. This is the social scientists' perpetual lament. The absence of information about work skills enhancement that occurred between high school leaving and entry into the most recent full-time job, upon which this paper's analysis is based, is the most serious deficiency about which readers must be alerted.